



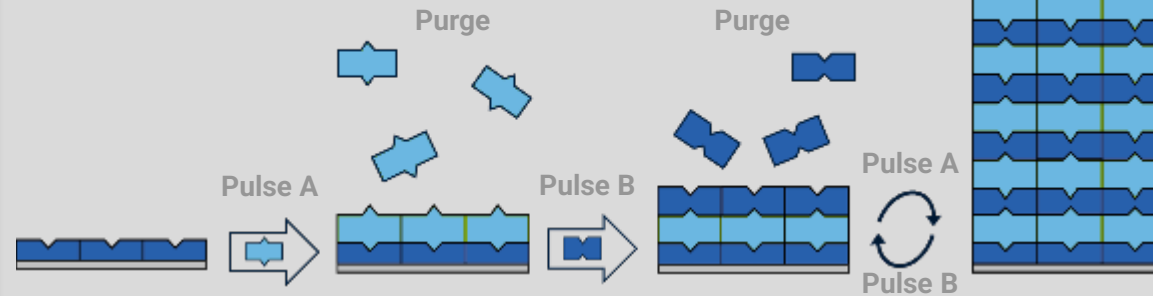
Domestic Lithium-Ion Cell Production and Performance Characteristics

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SPW April 2024

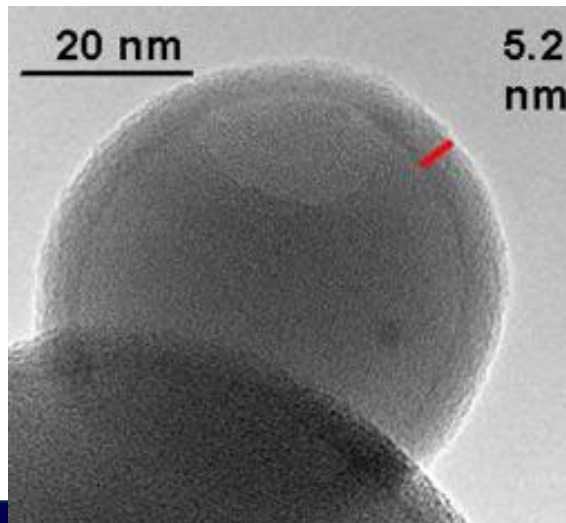
ATOMIC LAYER DEPOSITION (ALD)

Gas phase process
Self-limiting
No line-of-sight limitations

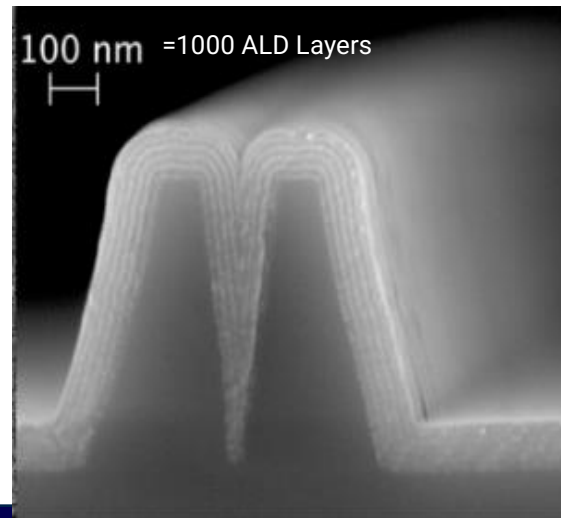


Atomic-scale control
Uniform, conformal
Customizable multi-layers

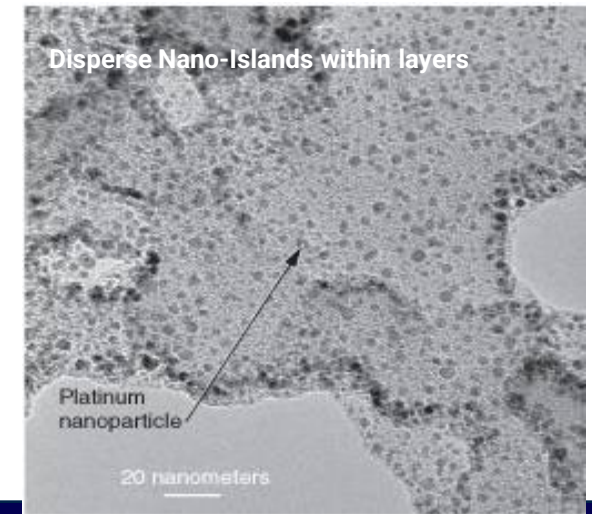
Precision thickness control



Tailored multilayers

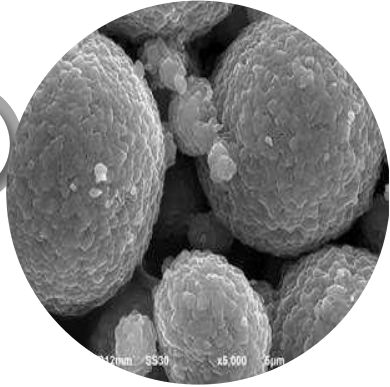


Conformal coatings

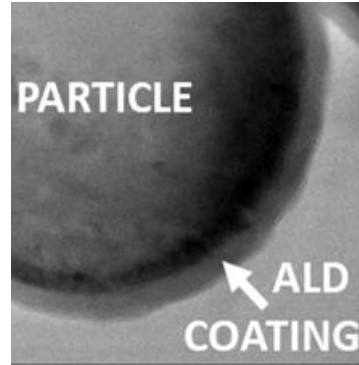


ATOMIC LAYER DEPOSITION (ALD)

Raw Materials



Nano Coatings



+

ALD
*Atomic
Layer
Deposition*

=

Better Products



Batteries



Fuel Cells



Semiconductor



Magnetics



3D Printing



Catalysis and more...

Benefits of Forge Nano coatings



Strong chemical bond to surface



Modify surfaces to enhance performance



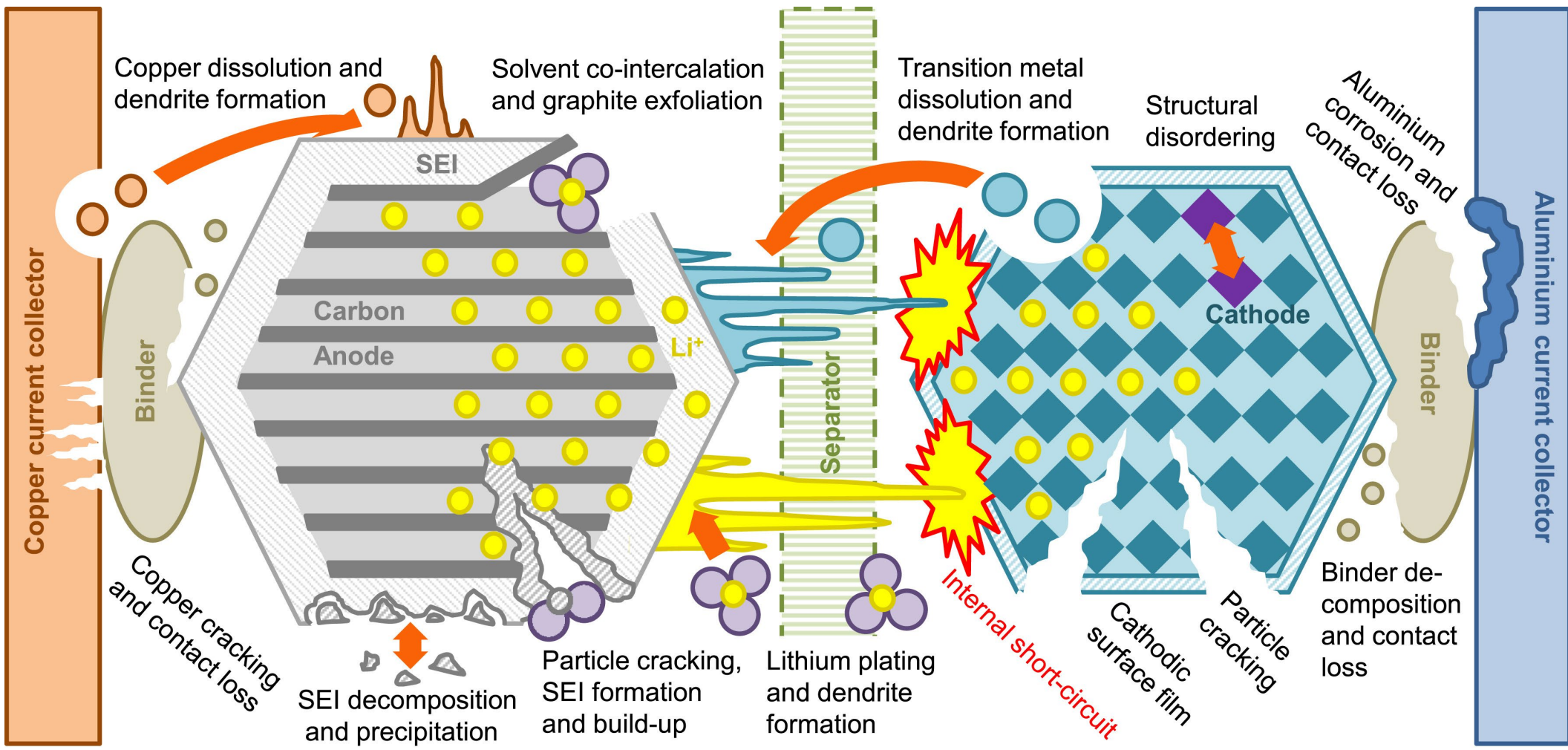
Uniform and pin-hole free coatings



Precision coatings reduce cost

Forge Nano has a proven capability to deliver ALD at scale to these applications

Atomic Armor Mitigates Battery Degradation Mechanisms



FORGE NANO “SUPER CELL”



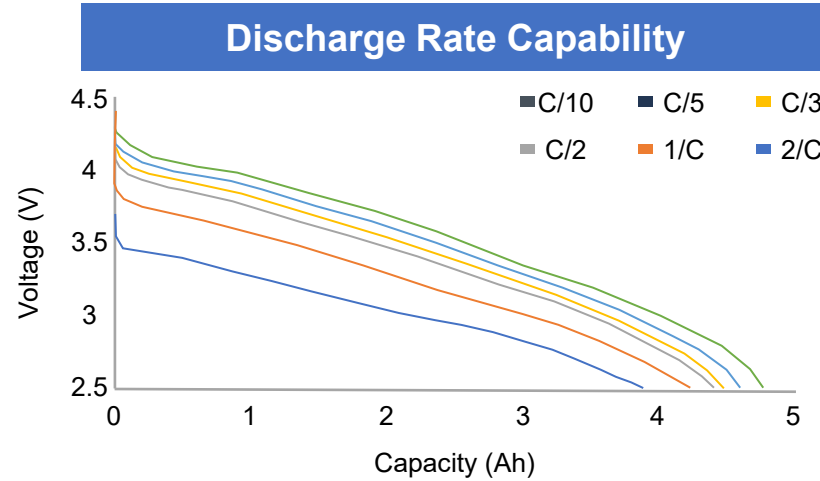
“Gen 1” Cells: 275 Wh/kg

- 21700 Cells available now
- 18650 Cells available now



“Gen 1.1” Cells: 300 Wh/kg

- 21700 Cells available Q4 2023
- 18650 Cells available Q4 2023



Charge Capacity (Discharging at 0.2C)

Charge Rate	% of C/10
0.1C	100%
0.2C	95%
0.33C	95%
0.5C	95%
1.0C	94%
2.0C	93%

Cell Comparison (Energy Cells)

Specification	LG M50T	Panasonic Model 3 21700	Samsung SDI 50E	Forge Nano 2149-10 (2022)	Forge Nano 2156-10 (2023)
Energy Density (Wh/kg)	260	250	260	275	307
Capacity (Ah)	4.8	4.8	4.9	4.9	5.6
Nominal Voltage (V)	3.6	3.6	3.6	3.6	3.4
Cycle Life	-	-	-	>700	>500

FORGE BATTERY 21700 CELL LINE



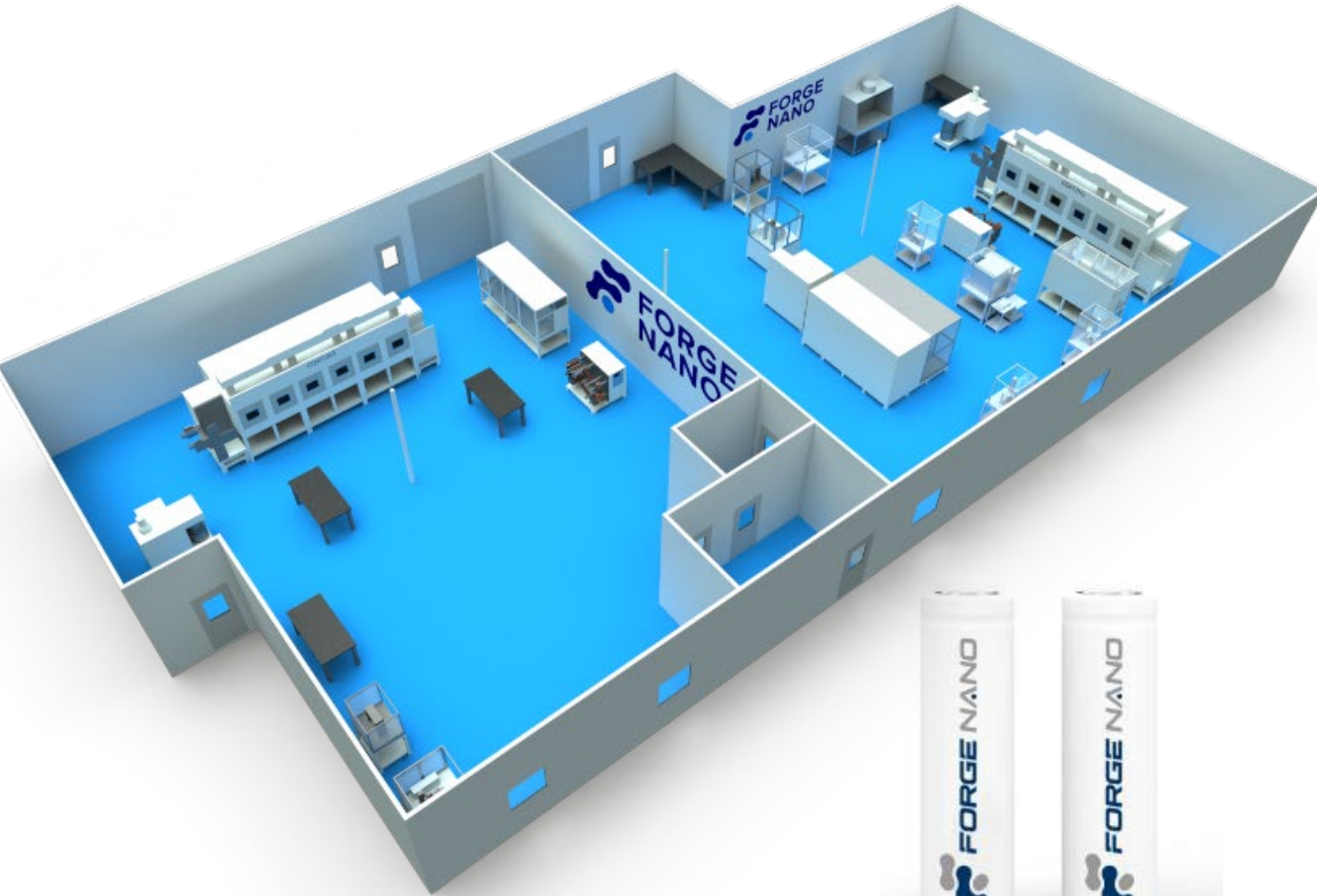
	Energy	Power
Cell	<ul style="list-style-type: none"> • FB2155-V10 	<ul style="list-style-type: none"> • FB2145-V10
Chemistry	<ul style="list-style-type: none"> • NMC811 and Synthetic Graphite + SiC 	<ul style="list-style-type: none"> • NMC811 and Synthetic Graphite + SiC
Capacity	5.6Ah (5.4Ah Min) <ul style="list-style-type: none"> • Charge: 0.1C, 4.35V, .05C cut off @ RT • Discharge: 0.1C, 2.5V cut off @ RT 	4.6Ah (4.4Ah Min) <ul style="list-style-type: none"> • Charge: 0.1C, 4.2V, .05C cut off @ RT • Discharge: 0.1C, 2.5V cut off @ RT
Voltage Range	<ul style="list-style-type: none"> • 2.5-4.35V 	<ul style="list-style-type: none"> • 2.5-4.2V
Nominal Voltage	<ul style="list-style-type: none"> • 3.46V 	<ul style="list-style-type: none"> • 3.54V
Energy	<ul style="list-style-type: none"> • 18.4 Wh @C/ (19.5Wh @ C/10) 	<ul style="list-style-type: none"> • 15.4 Wh @ C/3 (16.2Wh @ C/10)
Weight/Volume	<ul style="list-style-type: none"> • 63.5g (.02425L) 	<ul style="list-style-type: none"> • 60.3g (.02425L)
Energy Density	<ul style="list-style-type: none"> • 307 Wh/kg (804 Wh/L) at C/10, 291 Wh/kg (760 Wh/L) at C/3 	<ul style="list-style-type: none"> • 268 Wh/kg (667 Wh/L) at C/10, 257 Wh/kg (638 Wh/L) at C/3
Charging	<ul style="list-style-type: none"> • Standard – 0.33C with 0.05C cut off (CC-CV) • Fast – 1C (10-90% SOC) • Pulse – 5C (10 sec, SOC ≤ 80%) 	<ul style="list-style-type: none"> • Standard – 1.0C with 0.05C cut off (CC-CV) • Fast – 3C (10-90% SOC) • Pulse – 10C (10 sec, SOC ≤ 80%)
Discharging	<ul style="list-style-type: none"> • Standard – 0.33C • Fast – 1C (10-90% SOC) • Pulse – 5C (10 sec, SOC ≤ 80%) 	<ul style="list-style-type: none"> • Standard – 1.0C • Fast – 3C (10-90% SOC) • Pulse – 10C (10 sec, SOC ≤ 80%)
Cycle Life	<ul style="list-style-type: none"> • 500 Cycles to 80% SOH 	<ul style="list-style-type: none"> • 1000 Cycles to 80% SOH
Cell Dimension	<ul style="list-style-type: none"> • Height: 70.80mm (2.79" Max) • Diameter: 21.25mm (0.84" Max) 	<ul style="list-style-type: none"> • Height: 70.80mm (2.79" Max) • Diameter: 21.25mm (0.84" Max)
Operating Temperature	<ul style="list-style-type: none"> • Charge: 0-50°C • Discharge: -20-60°C 	<ul style="list-style-type: none"> • Charge: 0-50°C • Discharge: -20-60°C
Storage Temperature	<ul style="list-style-type: none"> • 1 year: -20-25°C • 3 month: -20-55°C • 1 month: -20-60°C 	<ul style="list-style-type: none"> • 1 year: -20-25°C • 3 month: -20-55°C • 1 month: -20-60°C

FORGE NANO 18650 CELL LINE



	Energy	Power
Cell	<ul style="list-style-type: none"> • FB1844-V10 	<ul style="list-style-type: none"> • FB1830-V10
Chemistry	<ul style="list-style-type: none"> • NMC811 and Synthetic Graphite + SiC 	<ul style="list-style-type: none"> • NMC811 and Synthetic Graphite + SiC
Capacity	3.7Ah (Min. 3.5Ah) <ul style="list-style-type: none"> • Charge: 0.1C, 4.35V, .05C cut off @ RT • Discharge: 0.1C, 2.5V cut off @ RT 	3.0 Ah (Min 2.8 Ah) <ul style="list-style-type: none"> • Charge: 0.1C, 4.2V, .05C cut off @ RT • Discharge: 0.1C, 2.5V cut off @ RT
Voltage Range	<ul style="list-style-type: none"> • 2.5-4.35V 	<ul style="list-style-type: none"> • 2.5-4.2V
Nominal Voltage	<ul style="list-style-type: none"> • 3.46V 	<ul style="list-style-type: none"> • 3.54V
Energy	<ul style="list-style-type: none"> • 12.7 Wh @C/10, 12 Wh@ C/3 	<ul style="list-style-type: none"> • 10.6 Wh @C/10, 10.1 Wh@ C/3
Weight/Volume	<ul style="list-style-type: none"> • 42.1g (.01654L) 	<ul style="list-style-type: none"> • 40.0g (.01654L)
Energy Density	<ul style="list-style-type: none"> • 302 Wh/kg (769 Wh/L) at C/10, 288 Wh/kg (728 Wh/L) at C/3 	<ul style="list-style-type: none"> • 259 Wh/kg (640 Wh/L) at C/10, 248 Wh/kg (611 Wh/L) at C/3
Charging	<ul style="list-style-type: none"> • Standard – 0.33C with 0.05C cut off (CC-CV) • Fast – 1C (10-90% SOC) • Pulse – 5C (10 sec, SOC ≤ 80%) 	<ul style="list-style-type: none"> • Standard – 1.0C with 0.05C cut off (CC-CV) • Fast – 3C (10-90% SOC) • Pulse – 10C (10 sec, SOC ≤ 80%)
Discharging	<ul style="list-style-type: none"> • Standard – 0.33C • Fast – 1C (10-90% SOC) • Pulse – 5C (10 sec, SOC ≤ 80%) 	<ul style="list-style-type: none"> • Standard – 1.0C • Fast – 3C (10-90% SOC) • Pulse – 10C (10 sec, SOC ≤ 80%)
Cycle Life	<ul style="list-style-type: none"> • 500 Cycles to 80% SOH 	<ul style="list-style-type: none"> • 1000 Cycles to 80% SOH
Cell Dimension	<ul style="list-style-type: none"> • Height: 65mm (2.55" Max) • Diameter: 18mm (0.71" Max) 	<ul style="list-style-type: none"> • Height: 65mm (2.55" Max) • Diameter: 18mm (0.71" Max)
Operating Temperature	<ul style="list-style-type: none"> • Charge: 0-50°C • Discharge: -20-60°C 	<ul style="list-style-type: none"> • Charge: 0-50°C • Discharge: -20-60°C
Storage Temperature	<ul style="list-style-type: none"> • 1 year: -20-25°C • 3 month: -20-55°C • 1 month: -20-60°C 	<ul style="list-style-type: none"> • 1 year: -20-25°C • 3 month: -20-55°C • 1 month: -20-60°C

FORGE NANO'S 1MWH CELL PROTOTYPE LINE



Forge Nano's Innovation Line

Commissioning: Dec 2024, Thornton, CO

3000 ft² Dry Manufacturing Facility

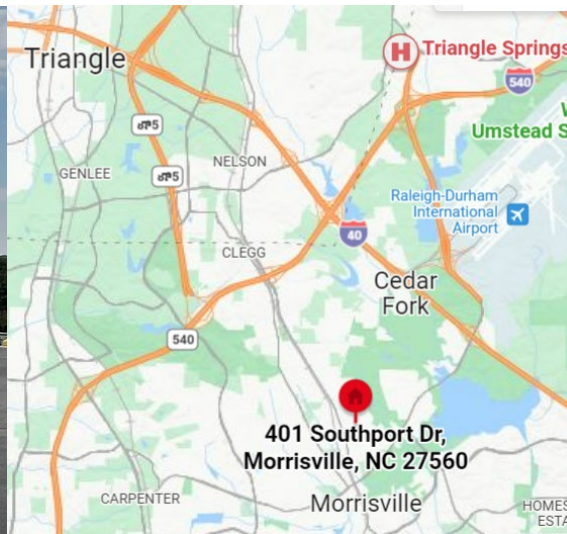
Line Capacity: 3 MWh (up to 10 MWh)

Cell Types: Cylindrical (18650/21700), Pouch

Project Types: POC; Joint Development



Forge Battery Inc, Site



Manufacturing (Sqft): 250+

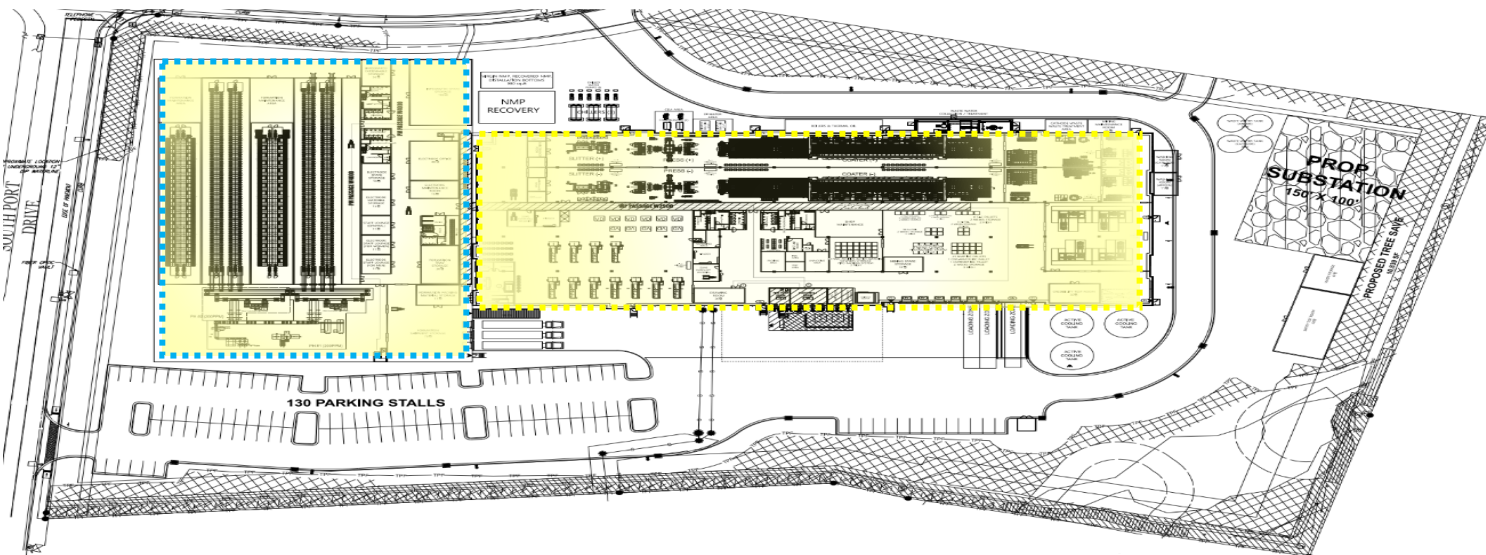
- 1st Floor = 182k
 - Main Bldg = 100k
 - Bldg Addition = 82k
- 2nd Floor = 66k – 100k
(LAYOUT DEPENDENT)

Capacity Plans (21700 Cylindrical):

- 2026 = 1.5 GWh
- 2028 = 2.8 GWh
- Max = >3 GWh (TBD 2029)

Lot (Acres): 12.3 (Landlocked)

Parking (#): 130

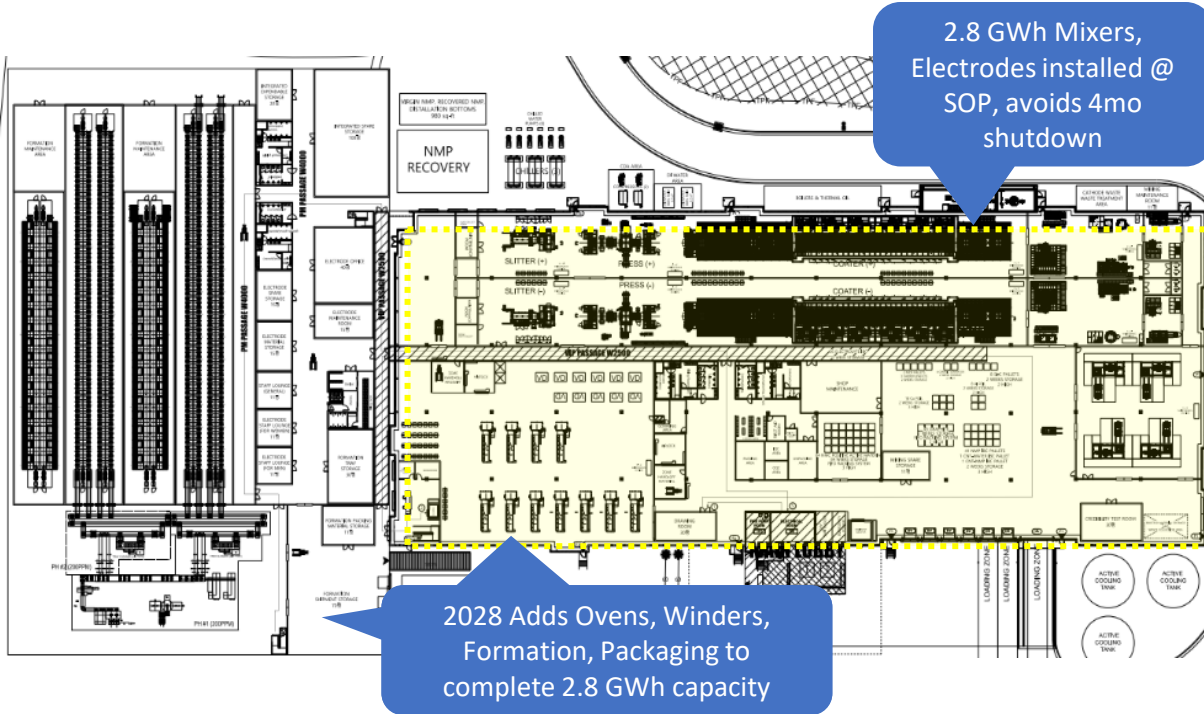


**Ideal Research Triangle location in the heart of
the new Battery Belt**

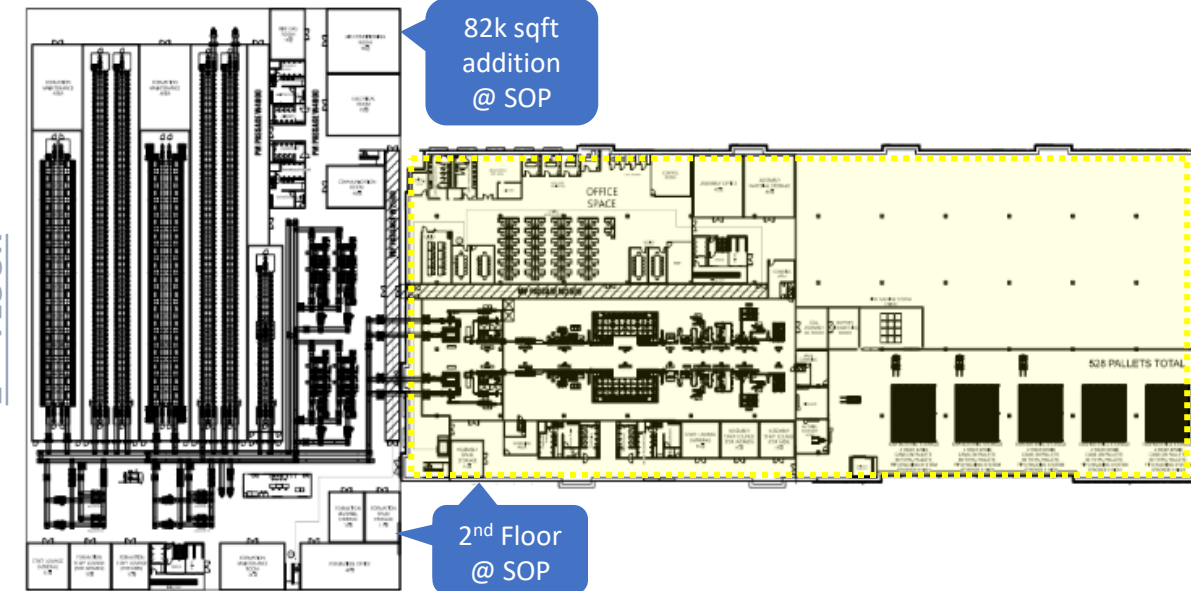
Site Layout - 2.4 GWh capacity, 21700 cells



1ST FLOOR



2ND FLOOR



PHASED EXPANSION

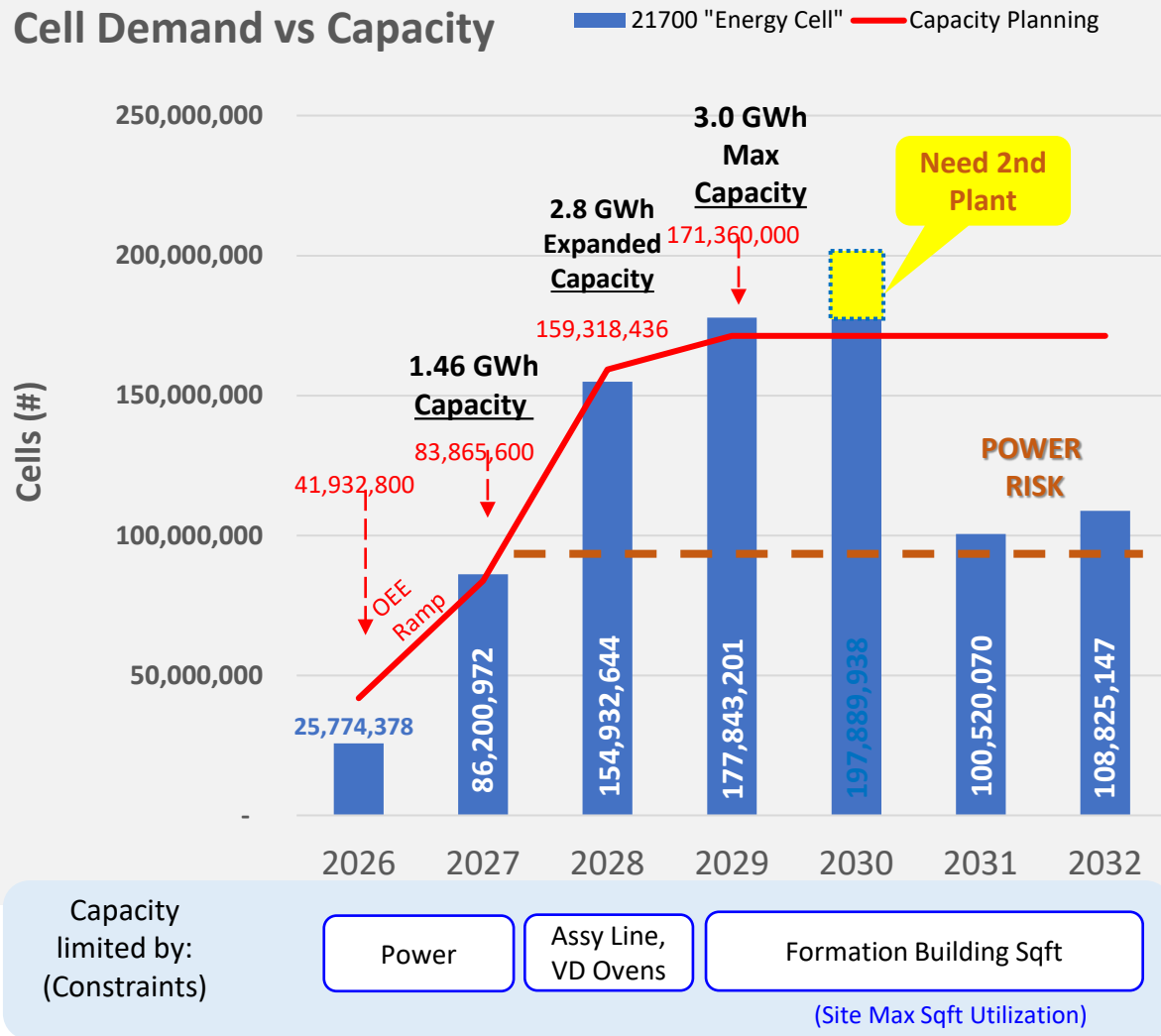
- 2026:** 1.5 GWh capacity installed, plus 2.4 GWh capacity upgrades on Mixers and Coaters
Bldg sqft expanded to enable later equipment drop ins (Addition and 2nd Floor construction)
Supplemental Generators for temporary Power onsite
- 2028:** 2.4 GWh capacity dropped in with expanded permanent Power arrival (new Duke substations)
- 2029:** Max GWh capacity drop ins will be considered pending SOP confirmations of actual Power use / supply

Morrisville Facility accommodates our current / future state needs for 21700 Cell orders

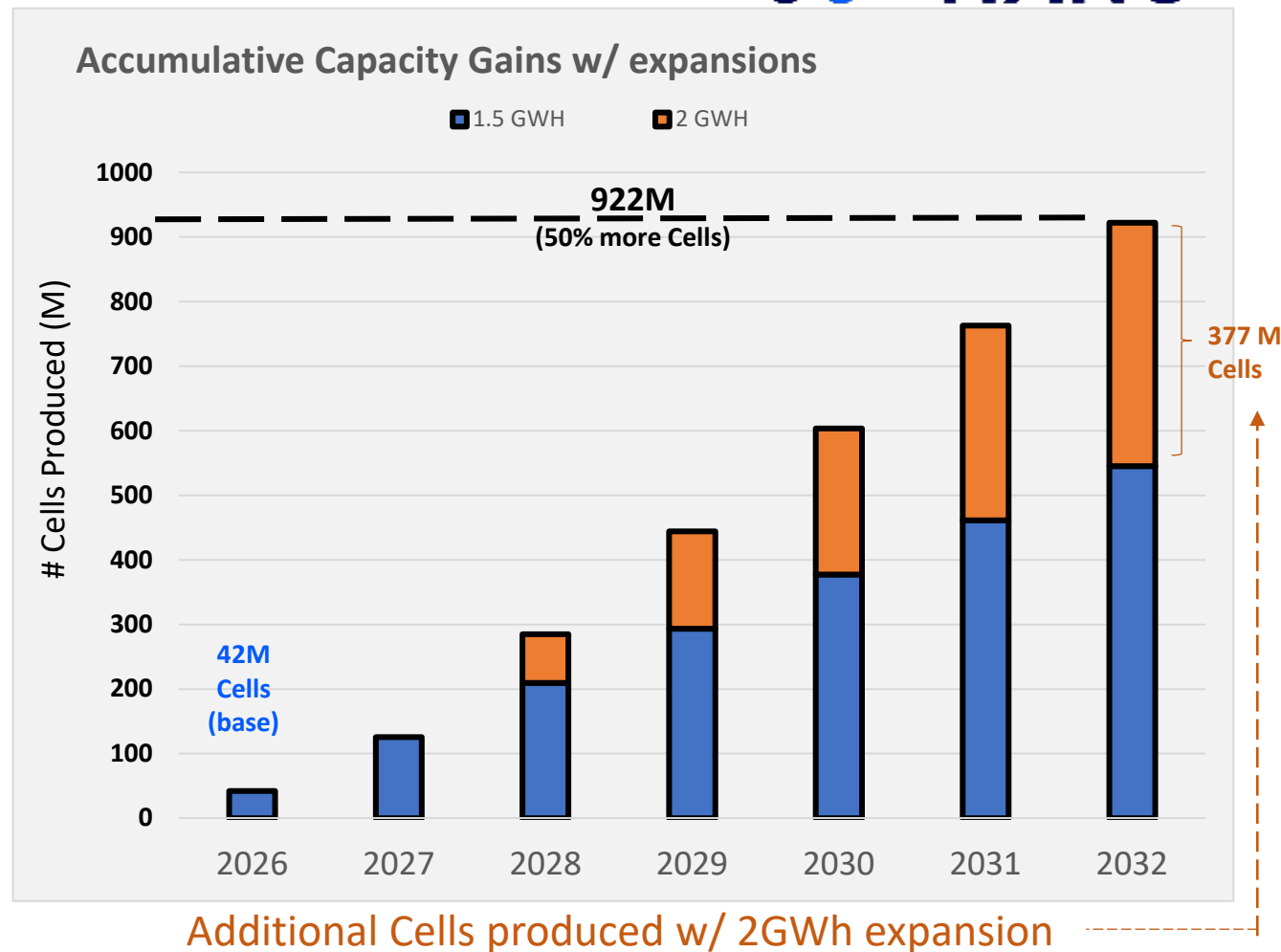
Demand vs Capacity & Expansion



Cell Demand vs Capacity



Accumulative Capacity Gains w/ expansions



Mfg Capacity meets current Customer Demands